Oleacina oleacea straminea Desh. c
solidula Pfr. .....a, b
Opeas micra Orb. .....a, b
Opisthosiphon bahamensis Shutt. ..... b
Ostrea elongata Linn.? var. a
Spirula peronii Lam. ....a, b
Spondylus echinatus Mart. a
Strombus bituberculatus .... Lam. ..... a
gigas Linn. .....a, b
Subemarginula octoradiata Gmel. ..... b
Succinea barbadensis Guild. b
campestris Say ..... a
luteola Gld. ..... a
ochracina Gundl. .... b
Tectarius muricatus Linn. a, b, c
Thais deltoidea Lam. ....a, b
floridana Conr. ..... a
haemastoma Linn. ... a
patula Linn. .....a, b
undata Linn. .....a, b
Thysanophora vortex Desh. a
Truncatella bilabiata Pfr. a, b
caribaensis Sowb. ....a, b
Urocoptis bahamensis providentia Pils. ..... b
elegans Pfr. c
Vermicularia spirata Phil. a, b
Vivipara georgiana Lea .. a

EULOTA MAACKII, A SIBERIAN SNAIL

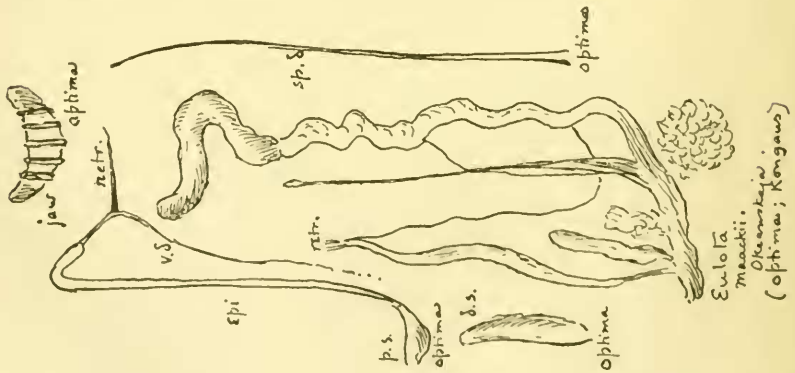
BY T. D. A. COCKERELL

About the middle of the last century R. Maack explored the Amur and Ussuri districts in eastern Siberia. This scientific pioneer made the most of his opportunities, and the results were published in St. Petersburg in three large volumes, 1859 (Amur) and 1861 (Ussuri). Consequently, when my wife and I recently visited Okeanskaja, on the coast near Vladivostok, we noted that the most magnificent butterfly of the region was *Papilio maackii* Ménètries, and the largest and handsomest snail was called *Eulota maackii* Gerstfeldt. Among the plants, Ruprecht and Maximowicz described from the Ussuri district a leguminous genus *Maackia*, which unexpectedly proved inseparable from *Cladastris*, based on a single species growing in Kentucky, Tennessee and North Carolina. There are also species of plants bearing the name of Maack; thus *Delphinium maackianum*, *Lonicera maackii* and *Prunus maackii*

are recognized as valid today. Gerstfeldt described Maack's mollusca, Diplopoda and Chilopoda; finding, as might be expected, a good proportion of new species. *Helix maackii*, then introduced as new, was said to be found rarely on the middle of the Amur, and also between Sungari and Ussuri. The original specimens had diam. maj. 30, min. 26.5, alt. 24-30 mm. Dr. Leopold von Schrenck (1859-1867), describing the mollusca of the Amur country, was able to record a long series of this *Helix maackii*, of which he recognized a form *elatior*, long. 25, lat. 31 mm., and a form *depressior*, long. 21, lat. 30 mm. The *elatior* form was really the type of Gerstfeldt, but the differences are those of individual variation, high and low spired shells occurring in the same colonies. When I first found *Eulota maackii* at Okeanskaja, early in July, I noted that the animal was dark slate-color, nearly black; no dorsal band; sole dull white, suffusedly greyish anteriorly; mantle brownish-white or pale grey. (*Eulota middendorffii* Gerst. differs in the color of the animal, which is pale, but also with no dorsal band.) This was a matter of interest, showing that there was no particular affinity with the common large Japanese species of *Eulota*, which have a conspicuous and handsome dorsal band. Anatomical examination confirmed the apparent divergence from the Japanese series, and indicated that *E. maackii* belong to true *Eulota*, and was not very remote from the European *E. fruticum*. The stout and short penis-sac passes into a very long and slender epiphallus (about 30 mm. long and 1.7 mm. thick in an Okeanskaja specimen), from the end of which arises the retractor, without any sign of a flagellum. The dart-sac is long and cylindrical, while the mucous glands constitute an amorphous sacculated mass. The vas deferens is about 35 mm. long. The sperm duct is long, simple, swollen at the base, but beyond that filiform, with hardly any bulb. The long and slender uterus has a cylindrical pale yellow albumen gland, about 26 mm. long. These characters are all derived from fresh material.

The discovery of *E. maackii* at Okeanskaja, taken with the previously published records, indicated a wide distribution. It was nevertheless a little disappointing to find the snail quite

unmodified about 400 miles up the coast, in the valley of the Amagu River, n. lat. 46°. The snails we collected were on the Kudia River, a tributary of the Amagu, and although there was much individual variation in the height of the spire, I could not detect any tendency to the formation of a distinct race. There was also no basis for the separation of these coast snails from those of Maack, which were found inland. After this, it was distinctly surprising to find that at Kongaus, a place in the hills no great distance east of Vladivostok, the *E. maackii* were uniformly of a distinct, gigantic race, with a maximum diameter of 33.5 to 34.5 mm., rarely as small as 32.5. The difference in measurement involves a great difference in actual bulk, and the form deserves to rank as a new subspecies, *Eulota maackii optima*.[1] A specimen of *optima* which I dissected differed from the Okeanskaja *maackii* in having the retractor arising from the vas deferens, about 5 mm. beyond the well-defined end of the epiphallus. Whether this is a constant character is perhaps doubtful. The jaw of Okeanskaja *maackii* has five strong thick ribs, in the manner of *E. duplocincta* Mart. That of *optima* has the five ribs well sep-



Anatomy of *Eulota maackii*, from Okeanskaja, and jaw, sperm duct, dart sac, and ephiphallus, etc., of *optima* from Kongaus.

[1] Ann. Mag. Nat. Hist., June, 1924, p. 580.

arated, after the style of *E. platyomphala* Mlldff. My assistant, Mr. A. I. Lavrushin, was so fortunate as to find near Kongaus a beautiful albino shell of *optima*, clear yellowish-white without markings, max. diam. 32 mm. This I will call mut. *albida*. I was interested to learn that there is a nephew of Maack's living in Vladivostok at the present time — an engineer.

NOTES

The Purple Dye of Molluscs.—Any one desiring information on this subject can find a most interesting and comprehensive account in a paper entitled, "The Dyeing of Purple in Ancient Israel," by Rev. Isaac Herzog, published in the Proceedings of the Belfast Natural History and Philosophical Society, session 1919-1920, No. 2, pp. 21-33. As a summary the author says:—"The art of purple-dyeing in general, which dating from hoary antiquity—the mention of *tekelet* and *arganum* in the cuneiform texts occurs already about 1600 B. C.—passed through a long and checkered career, finally becoming extinct, at least in the Old World, on the fall of Constantinople 1453."—C. W. J.

Copies of Bryant Walker's recent paper on the Ancylidæ of South Africa can be had, gratis, on applying to him at 1306 Dime Bank Building, Detroit, Mich.

Colorado Land Shells.—Professor C. R. Crosby of the Department of Entomology, N. Y. State College of Agriculture, recently sent in *Pupilla blandi* Morse, *Vertigo modesta* Say and *Succinea avara* Say from Pingree Peak, Colorado. Also *Gonyodiscus shimeki cockerelli* Pils. from Stormy Peaks at 11,000 ft. The genitalia and teeth of the last are much as in *G. perspectiva*, but the strongly arched, narrow jaw has widely spaced, vertical lines, not close striae as in the eastern species. There are 18.1.18 teeth. Some of the shells show a few, broad, indistinct reddish flammules.—H. A. Pilsbry.